

## PATENT SPECIFICATION



Application Date: Sept. 5, 1931. No. 24,991/31.

380,926

Complete Left: June 8, 1932.

Complete Accepted: Sept. 29, 1932.

## PROVISIONAL SPECIFICATION.

## Improvements in or relating to Coin Actuated Vending Apparatus.

We, THOMAS SCOTT LUCAS, and CYRIL MINCHENER FRETWELL, both of 5, Wine Office Court, London, E.C., and both British Subjects, do hereby declare the nature of this invention to be as follows:—

This invention relates to coin actuated vending apparatus and has for its object to provide an improved, simple and effective construction of apparatus which is especially applicable for the sale of milk or other liquids in bottles and also may be used for the sale of other commodities.

According to the present invention a rotatable cage, drum or like structure is mounted upon a vertical fixed spindle having a quick screw thread co-operating with corresponding screw threads or the equivalent in a central boss or bosses carrying the cage, drum or the like, the cage, drum or the like being formed or provided with helically arranged supports for bottles or other articles, the pitch of the helix on which the supports are arranged being equal to the pitch of the screw threads referred to so that on rotation of the cage, drum or the like the supports referred to come successively into alignment with a vending aperture to which access is obtained through a coin controlled door, any suitable escape-ment mechanism being associated with the coin mechanism or with the door to permit or to effect the step by step move-

ment of the cage, drum or the like as the coin mechanism and the door are actuated for the removal of the commodities, it being understood that the rotary feed movement of the cage, drum or the like takes place under the influence of gravity. The door controlling the vending aperture may be a sliding door or a hinged or rotary door, and preferably is provided with a glass panel so that the commodities for sale can be seen.

The apparatus may be mounted in a suitable framework which may be provided with wheels and with means for fixing it behind the door of the shop or the like so that while the machine is in position the door may be opened and closed to a suitable extent.

The central part of the cage, drum or the like may be adapted to serve as an ice chamber for keeping the commodities cool, while furthermore the mechanism may be contained in a casing of more or less cylindrical form which may have an external appearance of a bottle or other device and thus may serve as an advertisement for the goods or commodities sold by the machine.

Dated this 5th day of September, 1931.

For the Applicants,

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## COMPLETE SPECIFICATION.

## Improvements in or relating to Coin Actuated Vending Apparatus.

We, THOMAS SCOTT LUCAS, and CYRIL MINCHENER FRETWELL, both of 5, Wine Office Court, London, E.C., both British Subjects, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to coin controlled vending machines, and in par-

ticular to machines of the kind in which a number of commodities to be vended is stored in a helical magazine rotatable at will upon a support with which the magazine is in screw-threaded or like connection, such that the co-operating parts of the support and magazine may move after the manner of a nut and bolt, for vending the commodities one at a time from the magazine. In a known vending

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machine of this kind, a helical magazine is mounted by means of a screw on a stationary co-axial nut, and is provided with shelves which are tilted to effect delivery of commodities through a chute. In another known machine, a cylinder, carrying a helical series of bottomless pockets is freed to turn and descend upon a threaded shaft, the commodities being removed one at a time by a lever arm which passes upwardly through a pocket and dislodges the commodity to fall down a delivery chute. It has also been proposed previously to store commodities to be vended upon a helical shaft or rail from which they are displaced, one at a time, as the helical shelf or rail is turned about a support with which it is in screw-threaded or like connection.

It will be noted that in all these known machines the articles are displaced or moved from position on the helical carrier or magazine, e.g., via a delivery chute to a position where they can be removed by hand.

The object of the present invention is to provide an improved machine of the kind referred to.

To this end, in a coin controlled vending machine in which the insertion of an appropriate coin permits or brings about, under the control of an escapement, such rotation of a magazine in the form of a helical series of compartments for commodities to be vended, as will bring one compartment of the series out of, and the next into, register with an opening in the casing of the machine, and, according to the invention, said opening in the casing of the machine is provided with a door which is freed upon the insertion of an appropriate coin, and the arrangement is such that, when the door is open, direct access is permitted through the opening to that compartment only, which is at any time being, in register with the opening, so that upon the insertion of an appropriate coin, a commodity may be removed directly by hand from its compartment of the magazine.

One form of the invention is illustrated by the accompanying diagrammatic drawings, of which

Figure 1 shows a machine in front elevation with the front part of the casing cut away to show the magazine and its support;

Figure 2 is a plan view of the machine with the top of the casing removed, and part of the front wall of the remainder thereof cut away to show the door of the delivery opening;

Figure 3 is an enlarged fragmentary view showing a portion of the magazine; Figures 4, 5 and 6 are fragmentary

sectional plan views also to an enlarged scale, which, in conjunction with Figures 7 and 8, show the door controlling the delivery opening and the escapement, Figures 7 and 8 being sections on the lines 7-7 of Figure 4 and 8-8 of Figure 5, respectively;

Figure 9 shows to the same enlarged scale a modified form of connection between the magazine and the support at the upper end thereof.

As shown, the machine comprises a casing, the lower part 11 of which has a bottom compartment 12 containing coin control mechanism (not shown) of known or convenient type, and the upper part 13 of which rests upon the lower part 11, as indicated at 14, and is removable to permit access to a magazine 15. The magazine 15 is in the form of a hollow cylinder 16 having cross members at its upper and lower ends, of which the upper is indicated at 17 in Figure 2. Both these cross members are formed with apertures concentric with the cylinder 16, through which extends freely a support spindle 18, and the upper cross member 17 has attached thereto by pin and slot connections indicated at 19 a slide 20, formed with a projection 21, at its inner end, adapted to extend into a helical groove 22 formed in the support spindle 18, as clearly shown in Figures 1 and 2; a spring 23, tending to move the slide 20 radially inwards. A plurality of longitudinal vanes, indicated at 24 and 25, extend radially from the cylinder 16, in pairs, at equal intervals therearound, and the longitudinal spaces between adjacent pairs of vanes 24 and 25 are divided into compartments 26, constituting commodity carriers, by partitions 27 extending therebetween at equal intervals apart. Thus between one vane 24 and the next vane 25 of a pair, there is a space extending throughout the length of the cylinder 16, and between said pair of vanes and the next pair there is a space divided into commodity carriers 26. From Figures 1 and 3 it will be seen that the partitions 27 at one side of an adjacent pair of vanes 24 and 25 are in such staggered relationship to those at the other side of said vanes, that all the commodity compartments 26 of the magazine are arranged in a continuous series extending helically around the cylinder 16.

In the front wall of the lower part 11 of the casing of the machine, there is formed a delivery opening 28, equal in size to the open side of a commodity carrier compartment 26, which is normally closed by a door 29 having a handle 30, pivotally attached to the

casing of the machine at 31, and influenced by a spring 32 to tend to assume the closed position. The pitch of the helical groove 22 of the support spindle 18 is equal to that of the helical series of commodity compartments 26 so that one complete revolution of the magazine 15 (in an anti-clockwise direction) will bring into register with the delivery opening 28 the compartment 26, previously disposed immediately thereabove. In the case illustrated, there are ten commodity compartments 26 per convolution of the series thereof and thus a tenth of a revolution of the magazine 15 will bring one compartment out of, and the next into, register with said opening 28. Also, in the machine described, the pitch of the helical groove 22 is such that, when free to rotate, the magazine will do so under the influence of gravity. Normally, however, it is restrained against rotation by means of an escapement finger 33 which lies in the path of the vanes 24 and 25 which thus serve as primary and secondary stops controlling the rotary movement of the magazine 15. This escapement finger 33 is carried at the end of a rod 34 mounted slidably on the lower part 11 of the casing of the machine, and has extending therefrom, outside said casing, at the lower part of the machine, a handle 35 whereby, upon the insertion of an appropriate coin, it may be moved downwardly against the influence of a spring 36 (see Figure 1) which tends to maintain said rod 34 in a normal position against a stop 37 to locate the escapement finger 33 normally at such a height that the corresponding part of each vane 24 will bear thereon and act as a primary stop to restrain the magazine against rotation with a commodity compartment 26 in register with the delivery opening 28.

The vanes 24 and 25 are formed with notches 38 and 39 respectively, (see Figures 3, 7 and 8), there being a notch 38 for each commodity compartment 26 and also a notch 39, which latter is located above the former so that when the corresponding commodity compartment 26 is in register with the delivery opening 28, said notch 39 will be in register with the escapement finger 33 then bearing upon the primary stop vane 24 above the notch 38 therein (see Figure 7). When the escapement finger 33 is moved downwardly (as shown in broken lines in Figure 7) by the handle 35, it will be brought into register with the notch 38 of the vane 24 and the magazine 15 will be permitted to rotate under the influence of gravity until the vane 25 acting as a secondary stop, contacts with said finger

33; and upon the release of the handle 35, the escapement finger 33 will move upwardly under the influence of the spring 36 to its normal position in register with the notch 39 of the secondary stop vane 25, permitting further rotation of the magazine 15; which rotation will continue until the vane 24, at the other side of the commodity compartment 26 previously in register with the delivery opening 28, impinges upon a rearward extension 40 of a sliding latch 41 of the door 29, moving it against the influence of a spring 42 so that the door 29 is free to be opened by means of the handle 30 (see Figures 5 and 8). When the door 29 is opened, the rearward extension 40 of the latch 41 is moved clear of the vane 24 and rotation of the magazine 15 continues until said vane 24 comes into contact with the escapement finger 33. Thus further rotation of the magazine 15 is prevented (see Figure 6) and the next commodity compartment 26 is in register with the delivery opening 28 so that a commodity 43 therein may be removed from the opening 28. Immediately upon release of the door 29, it will close under the influence of its spring 32 and the latch 41 will once more maintain it closed (see Figure 4). With a view to preventing accidental closure and latching of the door, the extension 40 of the latch 41 is such as to contact with a commodity, in a compartment 26, and thus prevent complete closure of the door under the influence of its spring 32 so long as the commodity 43 remains in the machine.

In order that the magazine 15 may be maintained in an elevated position and rotate the while, for re-charging when the upper part 13 of the casing is removed, the upper end of the support spindle 18 is formed with a circumferential groove 44 disconnected from the helical groove 22. Thus, by moving the slide 20 radially outwards against its spring 23 the whole magazine may be raised, and by releasing the slide 20 the projection 21 thereof may be engaged with this groove 44 to maintain the magazine raised. An alternative arrangement for maintaining the magazine in its raised position, which is preferable in the case of a large machine, is illustrated by Figure 9, where the helical groove 22 terminates in a circumferential groove 45, a deflector member 46 at the junction of the grooves 22 and 45 being adapted to move under the influence of a spring 47 about a radial axis to the position shown. In this case, a radial projection 48 on the magazine 15 is rigidly secured thereto and means are provided for dis-

placing the escapement finger 33 and extension 40 on the door latch 41 so that the magazine 15 may be moved to its raised position by reverse rotation until the radial projection 48 thereof enters the circumferential groove 45 to maintain it raised. Thus, so long as the magazine is rotated in a reverse direction it will be maintained elevated, the deflector member 46 effectively blocking the upper end of the helical groove 22. Immediately upon forward rotation of the magazine 15, however, the projection 48 will again enter the helical groove 22 and may be brought into position for use. In some cases, however, provision may be made for the entire removal of a magazine for replacement by another charged one.

In some cases, particularly where a large and heavy magazine is employed for containing a large number of heavy commodities, such for example, as milk bottles, the weight of the magazine may be counter-balanced in any known or convenient manner, the counter-balance weight being slightly less than the weight of the empty magazine, in order that when the magazine is nearly empty proper movement thereof may take place in order further to compensate for the inadequate counter-balancing of the fully charged magazine. The counter-balance weight may be in the form of a piston-like member, movable vertically in a cylinder containing an appropriate fluid and closed at both ends, this piston and cylinder arrangement serving after the manner of a dash-pot to resist the movement of the magazine. To allow for the progressively decreasing weight of the magazine as its contents are discharged one by one, the cylinder may be of progressively increasing diameter or transverse dimensions from its lower towards its upper end, the piston or weight being a close fit within the cylinder at the lower end of the latter.

A machine such as that described, may conveniently be used for the vending of ice cream, in which case the casing will be lined with heat insulating material indicated at 49 and the hollow cylinder 16 may serve to receive a refrigerant or such cooling material as solid carbon dioxide. If necessary, however, refrigerating chambers may be provided around the drum, or again, an automatic refrigerating apparatus may be used.

Machines according to the invention are particularly suited for use for the vending of articles of irregular shape, such for example, as bottles, jars, fruit and other commodities which are not necessarily packed in cartons of symmetrical form.

Although, preferably, the magazine is gravity or spring influenced to tend to rotate coaxially of a support with which it is in screw threaded or equivalent connection, it may be mounted in any known or convenient manner so as to be capable of rotational and longitudinal motion to bring the commodity carriers of the helical series successively into register with the delivery opening, each movement, to bring one carrier out of, and the next into, register with said opening, comprising, for example, two steps, one purely rotational and the other purely axial.

Preferably, the magazine and support are connected by means of a helical groove or rib on the one, with which engages one or more radial projections, which may carry rollers, on the other. In some cases, the support may extend co-axially around the magazine and be constituted, for example, by the casing of the machine.

Generally, it will be desirable to provide for the disconnection of the magazine from its support so that the magazine may either be raised or lowered for purposes of replacement or recharging. In some cases, however, the magazine may remain permanently connected with its support and means may be provided for locking the said support when the machine is in use and for releasing it to rotate to permit the magazine to be raised, thus imparting rotation to the support, when the magazine is replenished. Even in an arrangement such as that shown in Figure 9, the pin there indicated at 48 may be spring pressed into engagement with the groove there shown at 45.

Although, in the case shown, the commodity carriers are in the form of compartments separated by partitions from one another, they may be constituted by any convenient means for supporting commodities to be vended and need not necessarily be separated by partitions so long as the casing and delivery opening are such as to prevent access to all the carriers except that which at any time being is in register with the delivery opening.

The coin mechanism employed may be located in any desired position in relation to the magazine, and instead of the top part of the casing being removable, the casing may have one or more doors in the sides thereof to permit access to the magazine for purposes of replenishment.

Where an escapement finger, such as that described above, is employed, it will be preferable that the handle thereof should be always movable, but only con-

needed operatively with the escapement finger when an appropriate coin is inserted.

In the form shown, it is necessary to perform two manual operations, namely, that of shifting the handle and of opening the door, in the purchase of a commodity from the machine. In some cases, the escapement finger may be adapted to be operated directly by the opening and closing of a door mounted to slide up and down in a direction parallel with the axis of the magazine, in which case, as will be noted, the main revolution of the drum for each vending operation will take place immediately after the closing of the door, the opening of which will bring about the first stage of said revolution.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A coin controlled vending machine, in which the insertion of an appropriate coin permits or brings about under the control of an escapement, such rotation of a magazine in the form of a helical series of compartments for commodities to be vended, about a support with which it is in screw-threaded or like connection, as will move one compartment of the series out of, and the next into, register with an opening in the casing of the machine, wherein said opening in the casing of the machine is provided with a door which is freed upon the insertion of an appropriate coin and wherein the arrangement is such that, when the door is open, direct access is permitted, through the opening, to that compartment only, which is at any time being, in register with the opening, so that, upon the insertion of an appropriate coin, a commodity may be removed directly by hand from its compartment of the magazine.

2. A coin controlled vending machine as claimed in Claim 1, wherein the movement of the magazine to bring one compartment of the series out of, and the next into, register with the opening in the casing of the machine, is completed as a result of the door being opened, which results in direct access being permitted, through the opening, to that compartment only which is upon completion of the magazine movement, brought into register with the opening.

3. A coin controlled vending machine, as claimed in Claim 1 or 2, wherein a substantially radial plunger on the magazine is spring influenced to tend to

project into a helical groove formed in a substantially vertical spindle extending co-axially through and constituting a support for, the magazine.

4. A coin controlled vending machine as claimed in any preceding claim, wherein the magazine is in the form of a hollow cylinder having a plurality of vanes extending longitudinally from end to end thereof, in radial planes at equal intervals therearound; the longitudinal spaces between adjacent vanes being divided each into a series of compartments constituting commodity carriers by fixed partitions extending therebetween at equal intervals apart.

5. A coin controlled vending machine as claimed in any preceding claim, wherein the movement of the magazine upon the insertion of a coin brings it into co-operation with a latch on the door of the opening in the casing of the machine, so that said latch is retracted and said movement is interrupted until the door is opened by hand, bringing the latch out of co-operation with the magazine and permitting the movement of the latter to continue to bring the next commodity compartment into register with the delivery opening, when the movement of the magazine is terminated by the escapement.

6. A coin controlled vending machine as claimed in Claim 5, wherein the insertion of an appropriate coin renders operative a handle to move an escapement finger clear of a primary stop on the magazine against the action of a spring, by which said escapement finger is returned to its normal position clear of a secondary stop on the magazine, so that continued rotation of the latter into co-operation with the latch of the shutter or door of the delivery opening is permitted; there being a primary and secondary stop for each commodity compartment of the magazine.

7. A coin controlled vending machine as claimed in any preceding claim, wherein the weight of the magazine is counter-balanced in any known or convenient manner, by a weight slightly less than the weight of the empty magazine, and which is in the form of a piston like member movable vertically in a cylinder, containing appropriate fluid, closed at both ends, and which is of progressively increasing transverse dimension from its lower towards its upper end.

8. A coin controlled vending machine substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 8th day of June, 1932.

For the Applicants,  
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Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1932.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

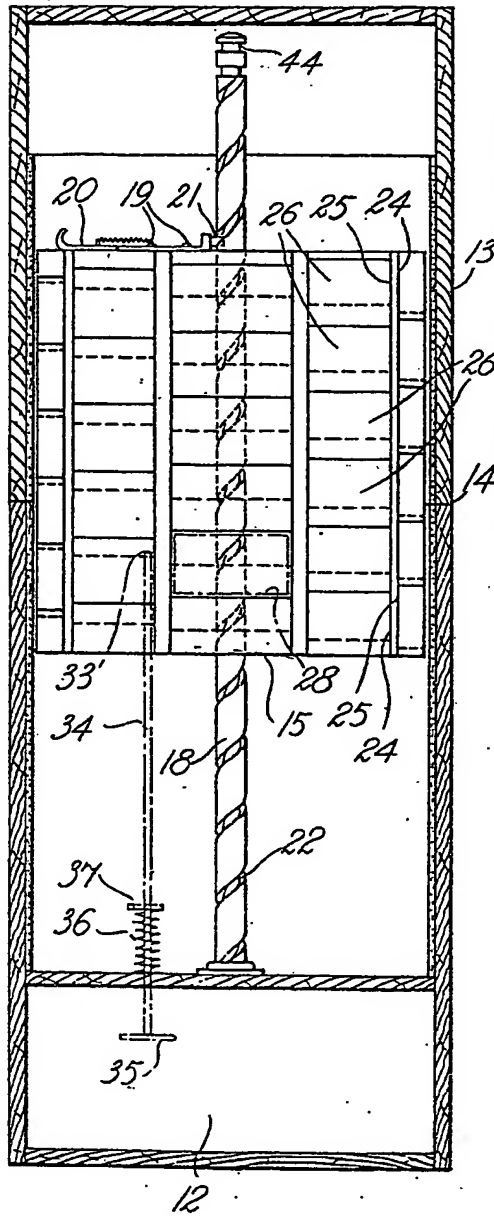


Fig. 2.

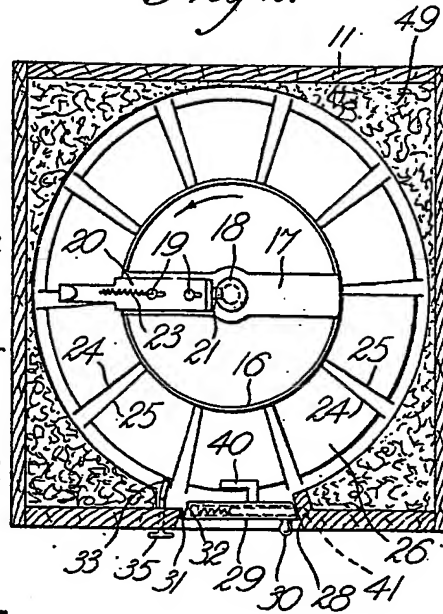
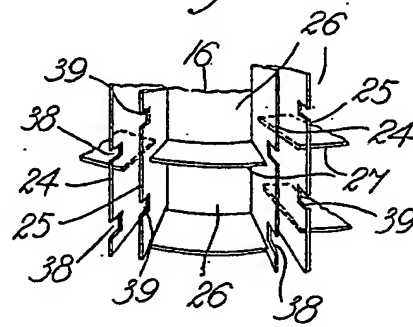
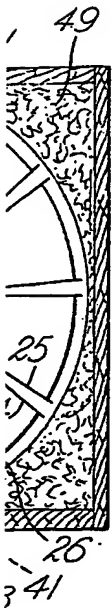


Fig. 3.





6  
25  
24  
27  
39

Fig. 4.

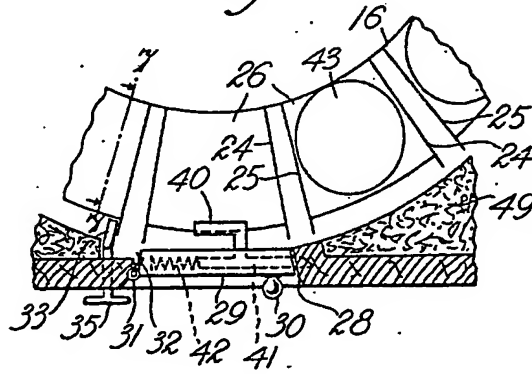


Fig. 5.

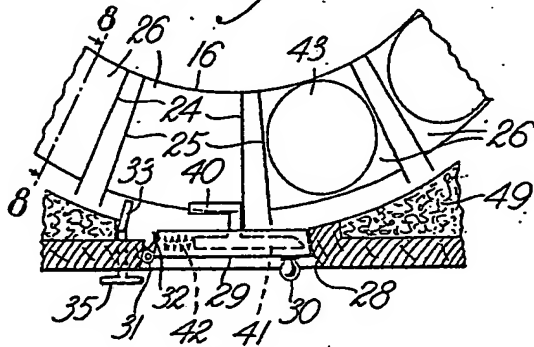


Fig. 6.

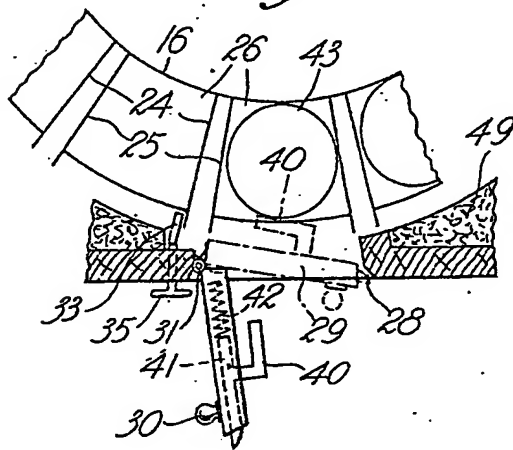


Fig. 7.

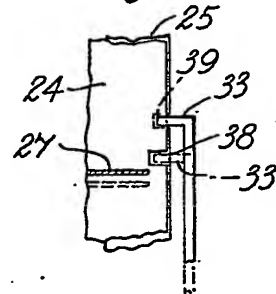


Fig. 8.

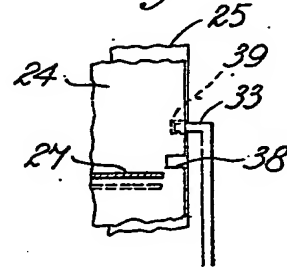


Fig. 9.

